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UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Christopher D. Voltz et al.

Confirmation No.:

Application No.: 10/039,163

Examiner: Cunningham, G.F.

Filing Date: 12/31/2001

Group Art Unit: 2676

Title: METHOD OF CHARACTERIZING DIGITAL-TO-ANALOG CONVERTERS IN A VIDEO SUBSYSTEM

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TRANSMITTAL OF APPEAL BRIEF

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Transmitted herewith in **triplicate** is the Appeal Brief in this application with respect to the Notice of Appeal filed on July 8, 2004.

The fee for filing this Appeal Brief is (37 CFR 1.17(c)) \$330.00.

(complete (a) or (b) as applicable)

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136(a) apply.

() (a) Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)-(d) for the total number of months checked below:

() one month	\$110.00
() two months	\$420.00
() three months	\$950.00
() four months	\$1480.00

() The extension fee has already been filled in this application.

(X) (b) Applicant believes that no extension of time is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

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Respectfully submitted,

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By Robert A. Manware

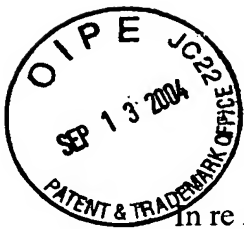
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:
Christopher D. Voltz et al.

Serial No.: 10/039,163

Filed: December 31, 2001

For: METHOD OF CHARACTERIZING
DIGITAL-TO-ANALOG CONVERTERS
IN A VIDEO SUBSYSTEM

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Examiner: Cunningham, Gregory F.

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Kerri Hyland

Sir:

APPEAL BRIEF PURSUANT TO 37 C.F.R. §§ 1.191 AND 1.192

This Appeal Brief is being filed in triplicate in furtherance of the Notice of Appeal mailed on July 8, 2004, and received by the Patent Office on July 12, 2004.

1. **REAL PARTY IN INTEREST**

The real party in interest is Hewlett-Packard Development Company, LP (hereinafter "HPDC"), the assignee of record in this application.

2. **RELATED APPEALS AND INTERFERENCES**

Appellants are unaware of any other appeals or interferences related to this Appeal. The undersigned is Appellants' legal representative in this Appeal. HPDC, the Assignee of the above-referenced application, as evidenced by the documents mentioned above, will be directly affected by the Board's decision in the pending appeal.

3. **STATUS OF CLAIMS**

Claims 1, 2, 4-20 and 22 are currently pending and under final rejection and, thus, are the subject of this appeal. Claims 3 and 21 have been cancelled.

4. **STATUS OF AMENDMENTS**

Appellants have not submitted any amendments subsequent to the Final Office Action mailed on March 10, 2004.

5. **SUMMARY OF THE INVENTION AND OF THE DISCLOSED EMBODIMENTS**

The present application is directed to a method of characterizing digital-to-analog converters (DAC) in a video subsystem having a non-volatile memory wherein DAC characterization data may be stored. Paragraph 8, lines 17-20. In one exemplary embodiment, the non-volatile memory may comprise an electrically erasable programmable read-only memory (EEPROM). Paragraph 8, lines 20-21. During manufacture of the video subsystem, each DAC that will be incorporated into the video subsystem is tested and characterization data for each DAC is obtained. DAC characterization data may be acquired from each DAC by providing predetermined digital input values into the DAC and measuring the voltage at the output of the DAC. *See e.g.*, paragraphs 11, 13 and 14. The digital output data is stored in the non-volatile memory and serves as characterization data for the analog performance corresponding to each DAC that will be used in a system. Paragraph 13, lines 19-22. The characterization data corresponding to each DAC is stored in the non-volatile memory before or during manufacture and may be accessed during operation of the video subsystem such that color management software may be implemented to perform specific

color correction or optimization using the digital characterization data obtained and stored for each DAC in the system. Paragraph 9, lines 1-4; paragraph 11, lines 15-21.

6. **ISSUES**

Issue No. 1:

Whether claims 11 and 16 are unpatentable under 35 U.S.C. § 102(b) over Wynne (U.S. Pat. No. 5,517,191).

Issue No. 2:

Whether claims 1, 4, 5 and 20 are unpatentable under 35 U.S.C. § 102(b) over Zalph (U.S. Pat. No. 5,245,326).

Issue No. 3:

Whether claims 2 and 6-10 are unpatentable under 35 U.S.C. § 103(a) over Zalph (U.S. Pat. No. 5,245,326) in view of Thomson (EP Pat. No. 0780986A2).

Issue No. 4:

Whether claim 22 is unpatentable under 35 U.S.C. § 103(a) over Zalph (U.S. Pat. No. 5,245,326) in view of Wynne (U.S. Pat. No. 5,517,191).

Issue No. 5:

Whether claims 12-15 and 17-19 are unpatentable under 35 U.S.C. § 103(a) over Thomson (EP Pat. No. 0780986A2) in view of Wynne (U.S. Pat. No. 5,517,191).

7. **GROUPING OF CLAIMS**

In regard to Issue No. 1, claims 11 and 16 will stand or fall together.

In regard to Issue No. 2, claims 1 and 20 will stand or fall separately. Claims 4 and 5 will stand or fall with claim 1.

In regard to Issue No. 3, claims 2 and 6-10 will stand or fall with claim 1.

In regard to Issue No. 4, claim 22 will stand or fall with claim 20.

In regard to Issue No. 5, claims 12-15 will stand or fall with claim 11. Claims 17-19 will stand or fall with claim 16.

8. **ARGUMENT**

As discussed in detail below, the Examiner has improperly rejected the pending claims. The Examiner has misapplied long-standing and binding legal precedents and principles in rejecting the claims under Section 103(a). Accordingly, Appellants respectfully request full and favorable consideration by the Board, as Appellants firmly believe that claims 1, 2, 4-20 and 22 are currently in condition for allowance.

Issue No. 1:

The Examiner rejected claims 11 and 16 under 35 U.C.C. § 102 (b) as being anticipated by Wynne (U.S. Patent No. 5,517,191). In the Final Office Action dated March 10, 2004, the Examiner stated:

A. Claim 11, “A computer system [col.2, Lns. 52], comprising: a processor; and a video subsystem coupled to the processor, the video subsystem comprising: a plurality of

digital-to-analog converters for a plurality of color channels of the video subsystem [col. 3, Lns. 43-49]; a video connector coupled to the plurality of digital-to-analog converters for connection to a monitor [shown in figs. 2 and 4]; and a non-volatile memory storing a plurality of digital characterization values for the plurality of digital-to-analog converters [shown in fig. 2]" is disclosed by Wynne [supra as detailed]. Wherein "calibration circuit which permits adjustment via digital commands [col. 2, Lns. 26-27", wherein commands and data for ADV476, lines D0-D7 and P0-P7 [col. 6, Lns. 61-65] accomplishes this, is system located in CPU 22, Fig. 2 [col. 5, Lns. 46-47] when desk top publishers or other graphic software applications are used with the computer system 10 [col. 5, Lns. 42-43] which interconnects computer with a hard drive 12a and floppy disk drive 12b.

B. Per independent claim 16, this is directed to a system for the system of independent claim 11, and therefore is rejected to independent claim 11.

Further, in the "response to arguments," the Examiner stated:

With regard to independent claims 11 and 16, Wynne discloses wherein "calibration circuit which permits adjustment via digital commands [col. 2, Lns. 26-27]", wherein commands and data for ADV476, lines D0-D7 and P0-P7 [col. 6, Lns. 61-65] accomplishes this, is system located in CPU 22, Fig. 2 [col. 5, Lns. 46-47] when desk top publishers or other graphic software applications are used with the computer system 10 [col. 5, Lns. 42-43] which interconnects computer with a hard drive 12a and floppy disk drive 12b.

Appellants respectfully traverse this rejection. Anticipation under Section 102 can be found only if a single reference shows exactly what is claimed. *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 227 U.S.P.Q. 773 (Fed. Cir. 1985). For a prior art reference to anticipate under Section 102, every element of the claimed invention must be identically shown in a single reference. *In re Bond*, 910 F.2d 831, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990). To maintain a proper rejection under Section 102, a single reference must teach each and every element or step of the rejected claim. *Atlas Powder v. E.I. du Pont*, 750 F.2d 1569

(Fed. Cir. 1984) Thus, if the claims recite even one element not found in the cited reference, the reference does not anticipate the claimed invention.

Claims 11 and 16 each recite a video subsystem comprising “a non-volatile memory storing a plurality of digital characterization values for the plurality of digital-to-analog converters.” The Wynne reference does not disclose this recited feature. The Wynne reference discloses a digitally controlled calibration circuit wherein an output signal from a DAC is calibrated by implementing a feedback loop. Specifically, the Wynne reference discloses providing a secondary calibration DAC whose output is fed back through a reference network to the primary DAC when the system is in calibration mode. Col. 4, lines 58-63. The primary DAC is adjusted or calibrated by entering a keyboard command to provide a digital signal to the secondary calibration DAC to modify its output current, thereby calibrating the primary DAC. Col. 4, line 63-Col. 5, line 6. Adjustments to the secondary calibration DAC, which in turn initiate calibration of the primary DAC, are only implemented based on the entry of commands via a keyboard, touch-screen or mouse while the system is in the calibration mode. Col 5, lines 6-8.

In stark contrast to the present disclosure, the Wynne reference simply discloses a system wherein the DACs may be calibrated by a user entering commands (via a keyboard, for example) during a calibration mode of the video subsystem. The Wynne reference does not disclose accessing a non-volatile memory device in the video subsystem when the video subsystem first begins operation, in accordance with the present invention. The Wynne reference only discloses a system wherein commands are entered to calibrate the DAC. Accordingly, the Wynne reference does not disclose storing characterization values, at all,

much less “a non-volatile memory storing a plurality of digital characterization values for the plurality of digital-to-analog converters,” as recited in claims 11 and 16.

The Examiner cites Fig. 2 as disclosing the presently recited non-volatile memory. Appellants traverse this assertion. While Fig. 2 of the Wynne reference illustrates a hard drive 12A and a floppy disk drive 12B, the drives 12A and 12B can hardly be considered part of the video subsystem, as in claims 11 and 16. Even if the drives 12A and 12B could be characterized as the non-volatile memory of a video subsystem, there is nothing in the Wynne reference to suggest that digital characterization values for the DACs are stored on the drives 12A and 12B. As discussed above, the Wynne reference does not disclose storing digital characterization values, at all, since there is no need to store such values in accordance with the calibration techniques disclosed in the Wynne reference. As discussed above, in accordance with Wynne, calibration commands are entered by a user while the system is in a calibration mode and adjustments to the primary DAC are made through use of the secondary calibration DAC. The Examiner failed to cite where in the Wynne reference a non-volatile memory is disclosed or where in the Wynne reference *any* device for storing characterization values is disclosed. Appellants respectfully submit that the Wynne reference *does not* disclose such features.

In the Advisory Action mailed on June 10, 2004, the Examiner further stated:

With regard to applicant’s argument to claims 11-19 (independent 11 and 16) of Final Office Action; while although Microsoft Press Computer Dictionary defined nonvolatile memory as the term is occasionally used in reference to disk subsystems as well, the applicant’s remark on page 10 of response received 5/13/04: “Even if the drives 12A and 12B could be characterized as the non-volatile memory of a video system, there is nothing in the Wynne reference to suggest that digital characterization values for the DAC’s are stored on the

drives 12A and 12B” is sufficient since it is well known that one can backup all data and parameters to the harddrive or floppy. Furthermore such characterization and storing to non-volatile memory is well known in the art for instance see Peon et al. (US Patent 6,195,030 B1), col. 2, lns. 14-21, col. 4, lns. 1-12 and 23-33.

As a preliminary matter, Appellants would like to point out that in referring to things that are well-known in the art and citing the Peon reference (U.S. Pat. No. 6,195,030) in support of this assertion the Examiner recognizes that the Wynne reference alone does not disclose the features recited in claims 11 and 16. References to rejections based on assertions of common knowledge in the art are discussed with regard to rejections made under 35 U.S.C. § 103. *See* M.P.E.P. § 2144. Appellants respectfully assert that the Examiner’s rejection under 35 U.S.C. § 102 is improper. Indeed, M.P.E.P. § 2131.01 recognizes that rejections under 35 U.S.C. § 102 over multiple references is generally improper, but recognizes that a multiple reference rejection under 35 U.S.C. § 102 *may* be proper to show that a characteristic not disclose in the reference is inherent. *See* M.P.E.P. § 2131.01. If the Examiner is attempting to use the Peon reference in support of establishing inherency, Appellants point out that the Examiner has stated clearly that “one *can* backup all data and parameters to the harddrive or floppy.” Emphasis added. Appellants respectfully remind the Board that if the Examiner relies on a theory of inherency, the extrinsic evidence must make clear that the missing descriptive matter is *necessarily* present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. *In re Robertson*, 169 F.3d 743, 49 U.S.P.Q.2d 1949 (Fed. Cir. 1999) (Emphasis Added). The mere fact that a certain thing *may* result from a given set of circumstances is not sufficient. *Id.* In relying upon the theory of inherency, the Examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic *necessarily* flows from the teachings of the applied prior art. *Ex parte Levy*, 17 U.S.P.Q.2d

1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original). The Examiner, in presenting the inherency argument, bears the evidentiary burden and must adequately satisfy this burden. *See id.*

Appellants respectfully assert that the rejection of claims 11 and 16 under 35 U.S.C. § 102 is improper and request that the Board find claims 11 and 16 as not anticipated by the Wynne reference. If the Examiner is asserting that the claims should be rejected under 35 U.S.C. § 103, Appellants respectfully request that the Examiner clarify the rejection in a future, non-final action. Regardless of whether the rejection is based on 35 U.S.C. § 102 or 35 U.S.C. § 103, the Examiner has not met his burden in showing that a video subsystem comprising “a non-volatile memory storing a plurality of digital characterization values for the plurality of digital-to-analog converters” is inherent. Indeed, Appellants assert that not only is storing characterization data corresponding to a DAC in a memory subsystem *not* inherent in view of common knowledge or any cited reference, but that such a feature is not anticipated and not obvious in view of any of the art of record.

Appellants firmly assert that the Wynne does not disclose, “a non-volatile memory storing a plurality of digital characterization values for the plurality of digital-to-analog converters,” as recited in claims 11 and 16. Because the Wynne reference fails to disclose all of the elements recited in claims 11 and 16, the Wynne reference cannot possibly anticipate these claims. Accordingly, Appellants respectfully request that the Board reverse the Examiner’s rejection of claims 11 and 16.

Issue No. 2:

The Examiner rejected claims 1, 4, 5 and 20 under 35 U.S.C. § 102 (b) as being anticipated by Zalph (U.S. Patent No. 5,245,326). Specifically, with respect to the independent claims, the Examiner stated:

A. Zalph discloses claim 1, "A method of characterizing a plurality of digital-to-analog converters for a plurality of color channels of a video subsystem of a computer system, the method comprising the steps of: driving the plurality of digital-to-analog converters with a set of predetermined input digital values; measuring a plurality of output analog voltages of the plurality of digital-to-analog converters in response to the driving step [col. 4, lns. 29-45]; and storing a plurality of digital characterization values corresponding to the plurality of output analog voltages in a non-volatile memory of the video subsystem such that the digital characterization values are permanently stored in the non-volatile memory [col. 5, lns. 11-30" as [detailed]. Wherein liquid crystal display system corresponds to a video system.

B. Per independent claim 20, this is directed to a method for performing the method of independent claim 1, and therefore is rejected to independent claim 1, particularly in col. 4, lns. 42-45.

Appellants respectfully traverse this rejection. As discussed above, the present application discloses measuring certain values on a DAC *to specifically characterize that particular DAC*. Once that particular DAC is characterized, *the characterization data for that particular DAC* is stored in a non-volatile memory device during manufacture of the memory subsystem. Once the values are stored in the non-volatile memory, those DACs that were individually and uniquely characterized are incorporated into the video subsystem. During later operation of the DACs, the characterization data uniquely corresponding to each of the respective DACs in the video subsystem may be accessed via the non-volatile memory device.

Claim 1 recites characterizing “a plurality of digital-to-analog converters for a plurality of color channels of a video subsystem,” comprising the steps of “driving the plurality of digital-to-analog converters,” “measuring a plurality of output analog voltages of the plurality of digital-to-analog converters,” and “storing a plurality of digital characterization values corresponding to the plurality of output analog voltages.” Similarly, independent claim 20 recites “characterizing a plurality of color channels of a video subsystem,” comprising “driving the plurality of color channels,” “measuring a plurality of output analog signals of the plurality of color channels,” and “storing a plurality of digital characterization values corresponding to the plurality of output analog signals voltages.” As recited in the present claims, the characterization of the digital-to-analog converters (claim 1) and of the color channels (claim 20) are made by implementing the digital-to-analog converters or color channels *of the video subsystem*. That is to say, the characterization of the digital-to-analog converters and color channels is performed on those digital-to-analog converters and color channels *which are implemented in the video subsystem itself*.

In contrast, the Zalph reference simply discloses *modeling* digital-to-analog converters that are implemented in an LCD system using similar digital-to-analog converters in a calibration system. Specifically, the Zalph reference discloses an LCD system 62 having a plurality of D/A converters 92 and a separate calibration system 96 having D/A converters 106 which “have the same conversion characteristics as those of converter 92 so that the analog output values thereof will be the same for a given digital input value.” Col. 4, lines 1-3. Prior to the start of calibration, the calibration system 96 is connected to the LCD system 62, thereby connecting the converters 106 to the system 62. Col. 4, lines 29-35. Once the output voltages are measured through the D/A converter 106 (which are in the calibration system 96 and *not* the LCD system 62), the measurements are stored in the RAM 114 of the

calibration system 96. Col. 4, lines 33-42. Finally, the digital values are stored in the NVRAM 93 of the LCD system 62, such that after completion of calibration when the LCD system 62 is first turned on, the output voltages may be accessed in the NVRAM 93. Col. 5, lines 11-18.

As explicitly described throughout the Zalph reference, the D/A converters 92 which are actually implemented in the LCD system *are not* measured at any point. Rather, a calibration system 96 having D/A converters 106 that have the same conversion characteristics as the D/A converters 92 are implemented to *model* the behavior of the converters 92. As described in the background of the present application, modeling the behavior of one DAC to predict the behavior of another DAC may provide inaccuracies and imprecision in the color channels of the video system. Even though each DAC may have similar characteristics and may use the same voltage source as a common reference, each DAC may not produce the same output voltage in response to the same digital input value. Specification, page 2, lines 3-9. Accordingly, the imprecision introduced by the system disclosed in the Zalph reference is one of the types of systems that the present invention is directed to improving. As recited in claims 1 and 20, each of the characterization steps that is performed is performed on the specific DACs which will be implemented in the video subsystem. The Zalph reference does not disclose such features.

In the Advisory Action mailed on June 10, 2004, the Examiner further stated:

With regard to claims 1-10 (independent claim 1) of Final Office Action, Examiner finds concurrence with Applicant in that Zalph primarily characterizes an LCD display system and not just a plurality of DAC's. However keeping in mind that said claim/s is/are silent on "during manufacture of the memory subsystem." Furthermore claim 1 speaks on that "digital characterization values correspond to the plurality of

output analog voltages,” but is silent on exactly how they are characterized. Whereas Zalph also characterizes DAC (D/A 106) along with the rest of the Fig. 2 system wherein the values stored in NVRAM (93) correspond in part on (D/A 106).

Now with respect to claims 20 and 22, Zalph teaches characterization of an LCD system, or better well known in the art as a “plant process” in general terms. Claim 20 is also directed toward a plurality of color channels. Such characterization of processes are we known and developed in the art as Control System Design & Simulation, Plant Process Control System, and/or State-Space System Simulation & Modeling, of which Zalph is given as an example.

Appellants would like to point out that the Examiner appears to be missing the point. Appellants are not arguing that because the Zalph reference discloses characterizing an LCD system and not just a plurality of DACs, that the present claims are allowable. Further, Appellants are not arguing that the present claims are distinguishable based on non-recited subject matter (i.e., characterizing the DACs “during manufacture of the memory subsystem”). Appellants assert that the present claims specifically characterizing a particular plurality of DACs that are implemented in a memory subsystem, storing the unique DAC-specific characterization data in a non-volatile memory device of the video subsystem and storing the characterization data corresponding to those DACs implemented in the video subsystem in a non-volatile memory device of the video subsystem. To be clear, the Zalph reference does not disclose obtaining characterization data for specific DACs and storing the characterization for those particular DACs in a non-volatile memory device in the video subsystem.

Because the Zalph reference does not disclose each of the elements recited in claims 1 and 20, the reference cannot possibly anticipate those claims or those claims dependent

thereon. Accordingly, Appellants respectfully request that the Board reverse the Examiner's rejection of claims 1, 4, 5 and 20.

Issue No. 3:

The Examiner rejected claims 2, and 6-10 as being unpatentable under 35 U.S.C. § 103(a) over Zalph (U.S. Pat. No. 5,245,326) in view of Thomson (EP Pat. No. 0780986A2).

Appellants respectfully traverse this rejection. The burden of establishing a *prima facie* case of obviousness under Section 103 falls on the Examiner. *Ex parte Wolters and Kuypers*, 214 U.S.P.Q. 735 (PTO Bd. App. 1979). Obviousness cannot be established by combining or modifying the teachings of the prior art to produce the claimed invention absent some teaching or suggestion supporting the combination or modification. *See ACS Hospital Systems, Inc. v. Montefiore Hospital*, 732 F.2d 1572, 1577, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984). Accordingly, to establish a *prima facie* case, the Examiner must not only show that the combination includes *all* of the claimed elements, but also a convincing line of reason as to why one of ordinary skill in the art would have found the claimed invention to have been obvious in light of the teachings of the references. *Ex parte Clapp*, 227 U.S.P.Q. 972 (B.P.A.I. 1985).

Claims 2 and 6-10 are dependent on claim 1. Accordingly, each of the claims rejected under 35 U.S.C. § 103 is dependent on claim 1, which was rejected under 35 U.S.C. § 102, as previously discussed with regard to Issue 2. Appellants note that the Thomson reference does not cure the deficiencies discussed above with regard to the Zalph reference. Accordingly, none of the cited references either alone or in combination, discloses each of the elements

recited in independent claim 1 on which the presently rejected claims depend. Accordingly, the cited references cannot possibly render the present claims obvious for at least the reasons discussed above with reference to the rejections under 35 U.S.C. § 102. Accordingly, Appellants respectfully request that the Board reverse the Examiner's rejection of claims 2 and 6-10.

Issue No. 4:

The Examiner rejected claim 22 as being unpatentable under 35 U.S.C. § 103(a) over Zalph (U.S. Pat. No. 5,245,326) in view of Wynne (U.S. Pat. No. 5,517,191).

Claim 22 is dependent on claim 20. Accordingly, claim 22 is being rejected under 35 U.S.C. § 103 and is dependent on claim 20, which was rejected under 35 U.S.C. § 102, as discussed above with reference to Issue 2. Appellants note that the Wynne reference does not cure the deficiencies discussed above with regard to the Zalph reference. Accordingly, none of the cited references either alone or in combination, discloses each of the elements recited in independent claim 20 on which rejected claim 22 depends. Accordingly, the cited references cannot possibly render the present claims obvious for at least the reasons discussed above with reference to the rejections under 35 U.S.C. § 102. Accordingly, Appellants respectfully request that the Board reverse the Examiner's rejection of claim 22.

Issue No. 5:

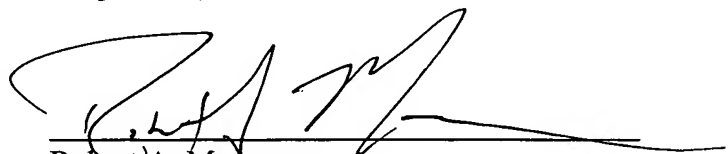
The Examiner rejected claims 12-15 and 17-19 as being unpatentable under 35 U.S.C. § 103(a) over Thomson (EP Pat. No. 0780986A2) in view of Wynne (U.S. Pat. No. 5,517,191).

Claims 12-15 are dependent on claim 11 and claims 17-19 are dependent on claim 16. Accordingly, each of the claims rejected under 35 U.S.C. § 103 is dependent on a claim that was rejected under 35 U.S.C. § 102 and discussed above with regard to Issue 1. Appellants note that the Thomson reference does not cure the deficiencies discussed above with regard to the Wynne reference. Accordingly, none of the cited references either alone or in combination, discloses each of the elements recited in independent claims 11 or 16 on which the presently rejected claims depend. Accordingly, the cited references cannot possibly render the present claims obvious for at least the reasons discussed above with reference to the rejections under 35 U.S.C. § 102. Accordingly, Appellants respectfully request that the Board reverse the Examiner's rejection of claims 12-15 and 17-19.

9. **CONCLUSION**

In view of the remarks set forth above, Appellants respectfully submit that the Examiner has provided no supportable position or evidence that claims 1, 2, 4-20 and 22 unpatentable over the art of record. Accordingly, Appellants respectfully request that the Board find claims 1, 2, 4-20 and 22 patentable over the prior art of record and reverse the Examiner's rejection of those claims.

Respectfully submitted,



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Date: September 10, 2004

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10. **APPENDIX OF CLAIMS ON APPEAL**

1. A method of characterizing a plurality of digital-to-analog converters for a plurality of color channels of a video subsystem of a computer system, the method comprising the steps of:

driving the plurality of digital-to-analog converters with a set of predetermined input digital values;

measuring a plurality of output analog voltages of the plurality of digital-to-analog converters in response to the driving step; and

storing a plurality of digital characterization values corresponding to the plurality of output analog voltages in a non-volatile memory of the video subsystem such that the digital characterization values are permanently stored in the non-volatile memory.

2. The method of claim 1, wherein the set of predetermined input digital values comprises only a maximum input digital value for the plurality of digital-to-analog converters.

4. The method of claim 1, the storing step comprising the step of:
storing a set of digital characterization values for each digital-to-analog converter of the plurality of digital-to-analog converters.

5. The method of claim 4, wherein the set of digital characterization values comprises only a single digital characterization value for each digital-to-analog converter.

6. The method of claim 1, wherein the set of predetermined input digital values comprises a plurality of input digital values for each digital-to-analog converter of the plurality of digital-to-analog converters.

7. The method of claim 1, wherein the plurality of digital characterization values comprise a plurality of digital representations of the plurality of analog output voltages.

8. The method of claim 1, wherein the plurality of digital characterization values comprise a plurality of digital values corresponding to a mathematical model for the plurality of analog output voltages.

9. The method of claim 1, wherein the measuring step is performed with a precision termination load resistor.

10. The method of claim 1, wherein the plurality of digital characterization values represents a plurality of transfer functions for the plurality of digital-to-analog converters.

11. A computer system, comprising:

a processor; and

a video subsystem coupled to the processor, the video subsystem comprising:

a plurality of digital-to-analog converters for a plurality of color channels of the video subsystem;

a video connector coupled to the plurality of digital-to-analog converters for connection to a monitor; and

a non-volatile memory storing a plurality of digital characterization values for the plurality of digital-to-analog converters.

12. The computer system of claim 11, wherein the plurality of digital characterization values represent a plurality of transfer functions for the plurality of digital-to-analog converters.

13. The computer system of claim 1, wherein the plurality of digital characterization values comprise a plurality of digital representations for a plurality of analog output voltages measured for the plurality of digital-to-analog converters by driving the plurality of digital-to-analog converters with a set of predetermined input digital values.

14. The computer system of claim 11, wherein the plurality of digital characterization values comprises only a single digital characterization value for each digital-to-analog converter of the plurality of digital-to-analog converters.

15. The computer system of claim 11, further comprising:
color management software executable by the processor to perform color correction based on the plurality of digital characterization values.

16. A video subsystem for a computer system, comprising:
a plurality of digital-to-analog converters for a plurality of color channels for the video subsystem; and
a non-volatile memory storing a plurality of digital characterization values for the plurality of digital-to-analog converters.

17. The video subsystem of claim 16, wherein the plurality of digital characterization values comprise a plurality of digital representations for a plurality of analog output voltages measured for the plurality of digital-to-analog converters by driving the plurality of digital-to-analog converters with a set of predetermined input digital values.

18. The video subsystem of claim 16, wherein the plurality of digital characterization values represent a plurality of transfer functions for the plurality of digital-to-analog converters.

19. The video subsystem of claim 16, wherein the plurality of digital characterization values represent a plurality of transfer functions for the plurality of digital-to-analog converters.

20. A method of characterizing a plurality of color channels of a video subsystem of a computer system, the method comprising the steps of:
driving the plurality of color channels with a set of predetermined input digital values;
measuring a plurality of output analog signals of the plurality of color channels in response to the driving step; and
storing a plurality of digital characterization values corresponding to the plurality of output analog signals voltages in a non-volatile memory of the video subsystem such that the digital characterization values are permanently stored in the non-volatile memory.

22. The method of claim 20, wherein the video system comprises a graphics controller.